

E-Gel Powerbase





FOTO/Phoresis



Fotodyne wThermal Printer



E-Gel Agarose
1.2% typical

ElectroPhoresis



Elchrom Origins

Detect Pictures to Jump to that Instrument



Link to Power Supply
and standard cell Electrophoresis SOP



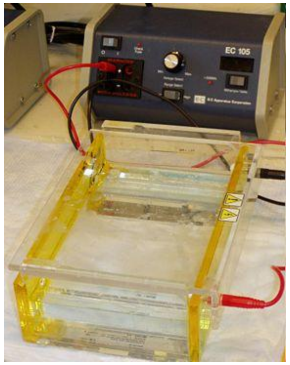
Transilluminator



Electroblotter @BRDG



Cambrex FlashGel (ref)



Prepared by: Bob Morrison
FVCC, Instrumentation Specialist

Original Sep 2008, Rev Apr 2012

Electrophoresis: ORIGINS by Elchrom Scientific

Width 55 cm Depth 41 cm Height 22 cm
Weight 18 kg
Gel compartment D 10.8 x W 27.8 cm



The ORIGINS by Elchrom™ comprises THE most cost-effective alternative to capillary electrophoresis: better results for lower costs!

Technical Features:

Integrated system for cooling/heating: no external water bath nor temperature probe required

Integrated temperature control: constant temperature of the running buffer independent of running time and voltage

Integrated pump for buffer circulation: guarantees constant temperature and eliminates pH gradients even in the vicinity of the electrodes

Parallel double-electrodes on either side of the gel compartment provide a homogeneous and uniform electric field.

Working temperature range: 4°C - 55°C

Link to Elchrom ORIGINS Technical Manual …. pdf

Link to Elchrom GEPS Power Unit User Manual …. pdf

Link to Elchrom Starter Kits for 2100U (110volt) …. pdf

Electrophoresis: ORIGINS, Major Features, Power



Description

1	On/Off button
2	Cables – connection to Power supply
3	Display
4	Navigation for Display
5	Electrodes
6	Cover
7	Outlet



Description of the back side p

1	On/Off button
2	Fuse 5 AT
3	Mains (115 / 230 V AC)
4	Serial number

Electrophoresis: ORIGINS, Mode of Operation Running Precast at 20C. Pg1 of 2

1. **Prepare the 30mM TAE buffer.** Fill the apparatus with 1.9 l 30mM TAE buffer, 2-3 mm above the upper electrode.

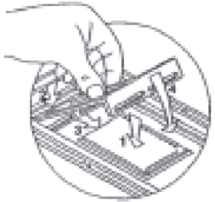
2. **Set-up the buffer to appropriate temperature.** During setting, Time should be OFF. Temperature is changed by one of the vertical arrows and saved by pressing SET button.

3. **Select and prepare the gel for electrophoresis.** Elchrom Scientifics' precast gels are ready to use. You only need to remove them from the packaging and pre-warm accoding to table on page 10.

   Cut the aluminium bag on one side. Take the plastic bag with the gel out, and cut the plastic bag on 3 sides. Peel the plastic off. Grip the gel with forceps at the plastic backing overhang.

4. **Place the gel into the ORIGINS unit.** Turn off the pump. Hold the gel with forceps at the plastic backing overhang. Make sure that no air bubbles are trapped under the plastic backing or in the sample wells. One Wide Mini gel presentation (all gels from one aluminium bag) or 3 Mini gels (8 samples each) can be run simultaneously.

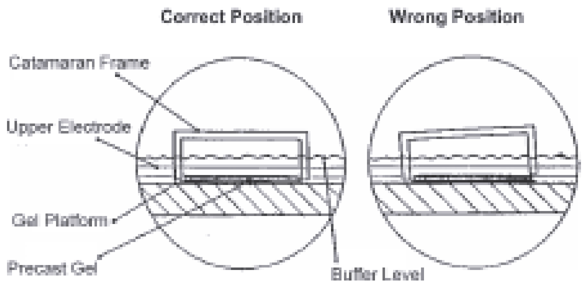
5. **Insert the Catamaran frame (Gel holder).** Select the appropriate Catamaran frame for your gel type to fix the gel in the center position in the apparatus. Insert one side of the Catamaran into the ORIGINS (2). Move the side close to and alongside the gel (3). Lower the other side of the Catamaran down until it rests on the plastic backing overhang (4). The gel can be moved closer to the anode or cathode by pressing a needle on the backing overhang and pushing in desired direction.



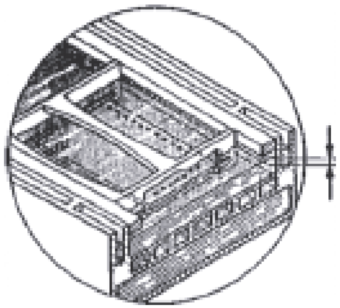
IMPORTANT when using Wide Mini S-4x25 and S-4x13 gels. The gel must be positioned such that the channel that separates the S-4x25 and S-4x13 gel sections is in line with the opening in the sides of the Catamaran S-50/100. This is necessary to ensure optimal buffer flow through the channel to wash away the DNA exiting the upper gel section.

Electrophoresis : ORIGINS Mode of Operation pg 2/2

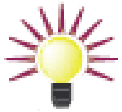
6. **Check the correct Catamaran position.** Its sides must rest on the plastic backing overhang in the center of the chamber and not on the gel. Sample wells need to be parallel to the electrodes.



7. **Adjust buffer level.**

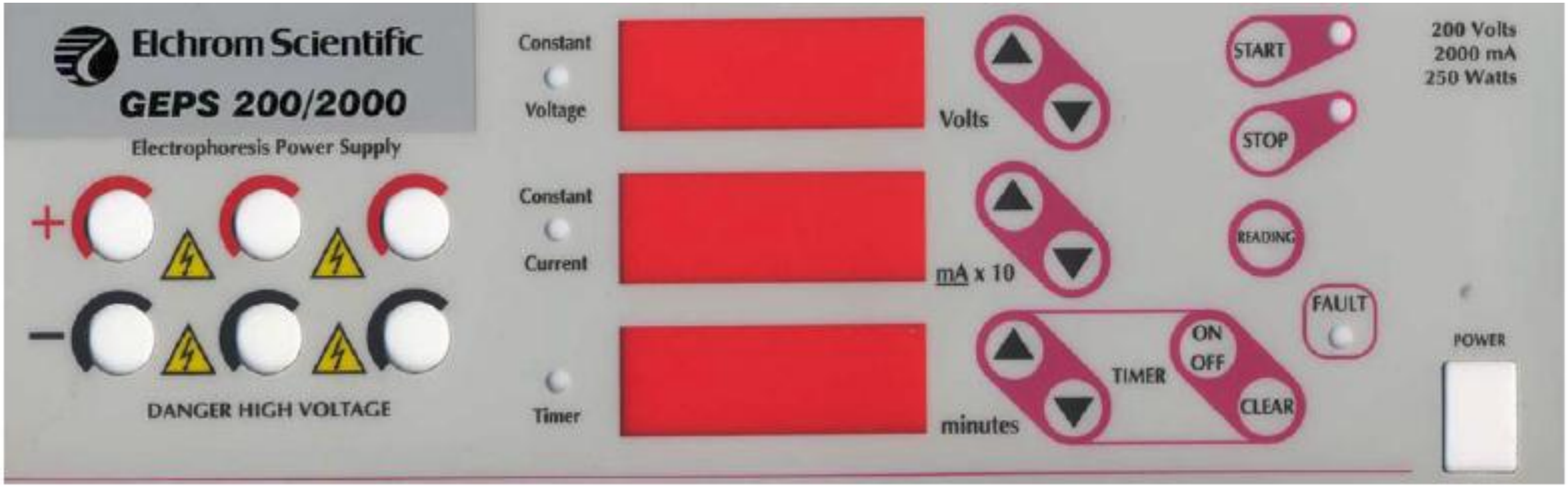


Buffer level should be about 2-3 mm above the upper platinum wire (see blue marked level on the left side). Remove excess buffer with a 20 -50 ml syringe if necessary



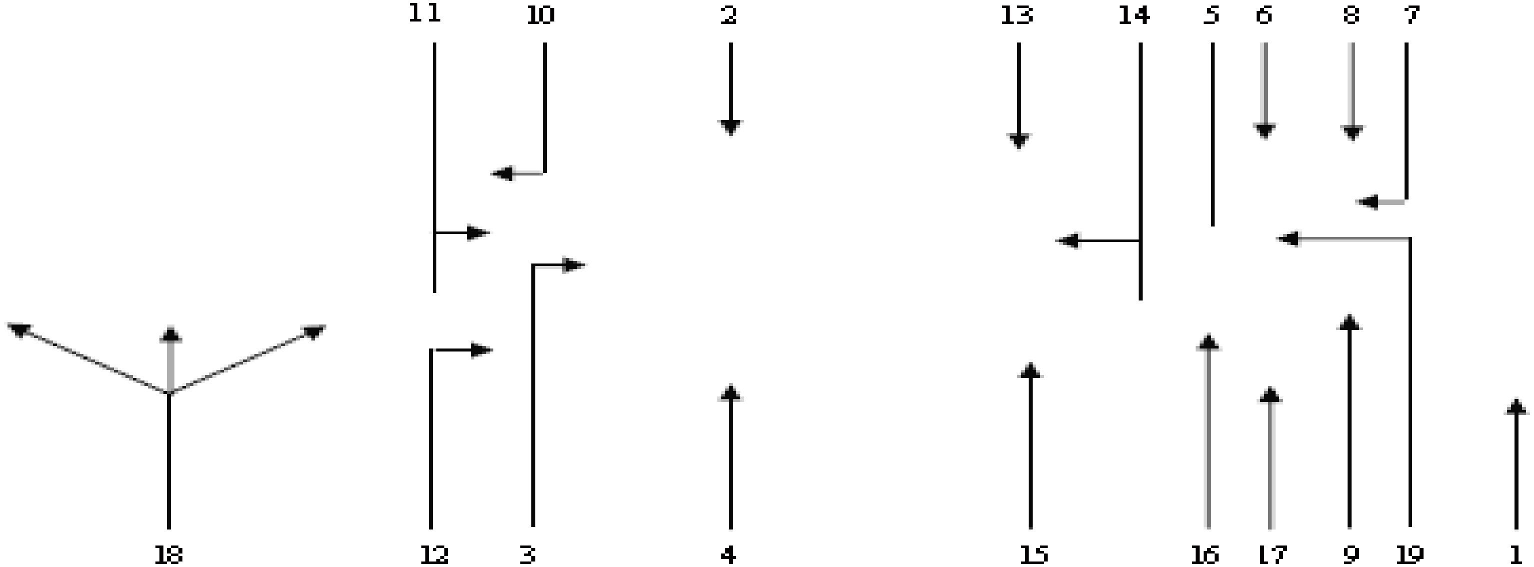
8. **Load your samples. Prior to loading switch off the Pump.** Load samples with a 1-20 µl pipette. Optimal loading volume is 4-8 µl. The width of the sample wells is wide enough to allow the loading using standard pipette tips.

Electrophoresis: ElChrom, Power Unit Controls



Link to Elchrom GEPS Power Unit User Manual …. pdf

Electrophoresis: ElChrom, Power Unit Controls



1	Main Power switch	Turns on unit
2	Voltage output Led	Display actual or set output in Volts
3	Current output Led	Display actual or set output in mA
4	Time in minutes	Display elapsed or set time in minutes
5	STOP switch	Terminates output
6	START switch	Begins output
7	STOP led	Indicates STOP mode
8	START led	Indicates START mode
9	FAULT led	Indicates ground leakage, no load or automatic restart situation
10	Volt mode Led	Indicates constant voltage mode
11	Milliamps mode Led	Indicates constant current mode
12	Timer mode Led	Indicates timer mode ON/OFF
13	Voltage increase/decrease	Increases/decreases voltage set point
14	Current increase/decrease	Increases/decreases current set point
15	Time increase/decrease	Increases/decreases time set mode
16	ON/OFF timer switch	Put timer ON/OFF mode
17	CLEAR switch	Cancel the elapsed time of a previous running
18	Output Jacks	Red = positive ; Black = negative
19	Reading switch	Display output set values

Electrophoresis: Elchrom Power Unit Output without Timer Mode

1. If the green LED located on the left of the TIMER is alighted , depress the ON/OFF switch of the TIMER on OFF position : the green LED located on the left of the display must be off.

2. Depress the START switch to initiate output. The START LED (green) will illuminate, and the output Leds will display the actual values simultaneously. Depending on the output set values one of the two modes Leds (VOLTS, MILLIAMPS) will illuminate, indicating the parameter controlling output.
Slight increases or decreases in output readings for those parameters not "limiting" will occur as the experiment progresses. These changes accurately represent changes in the resistive load (electrophoresis unit) due to changes in temperature, buffer capacity, etc. This is to be expected.

3. To view the output set values during the run, depress the READING switch. The Leds will display the output set values as long as READING switch is depressed. Once the READING switch is released, the Leds will display the output set values for three seconds, and then switch back to displaying the actual output values.

4. It is possible to change the values during the run without depressing the STOP switch.
To change the output set values during the run, depress the increase or decrease tactile switch until the appropriate output set value is reached.
In START status, when the reading switch is depressed, the Leds will display the output set values during three seconds and then switch back to displaying the actual output values.

5. To establish the limiting (constant) mode for the particular experiment, set the controlling parameter to the output desired, and increase the other output set value until the appropriate MODE LED (VOLT, MILLIAMPs) illuminates.

If the non-controlling output set values is reached during the course of the run, the power supply will automatically crossover to the new mode and control output relative to that mode. The appropriate MODE led will illuminate.

If automatic crossover is desired during the run, adjust the output set value of the second controlling parameter to the maximum setting desired. When actual output relative to the second controlling parameter equals its output set value, the output will cross over from the first controlling parameter to the second.

6. When the run has been completed, depress the STOP switch to cease power output. Wait one minute before disconnecting the power cords from the gel unit. Turn the main power switch off when the unit is not in use.

Electrophoresis: Elchrom Power Unit Output with Timer Mode

1. If the green LED located on the left of the TIMER is not alighted , depress the ON/OFF switch to activate the TIMER : then the green Led located on the left of the display illuminates.

2. Depress the CLEAR switch to cancel the previous elapsed values.

3. Set the new value in minutes by depressing the increasing and decreasing switches.
To change the output settings, use the V - mA dedicated tactile switches to increase or decrease the voltage or current settings.

4. Depress the START switch to initiate output. The START LED (green) will illuminate, and the output Leds will display the actual values simultaneously. Depending on the output set values one of the two modes Leds (VOLTS, MILLIAMPS) will illuminate, indicating the parameter controlling output.
Slight increases or decreases in output readings for those parameters not "limiting" will occur as the experiment progresses. These changes accurately represent changes in the resistive load (electrophoresis unit) due to changes in temperature, buffer capacity, etc. This is to be expected.

5. To view the output set values during the run, depress the READING switch. The leds will display the output set values as long as READING switch is depressed. Once the READING switch is released, the Leds will display the output set values for three seconds, and then switch back to displaying the actual output values.

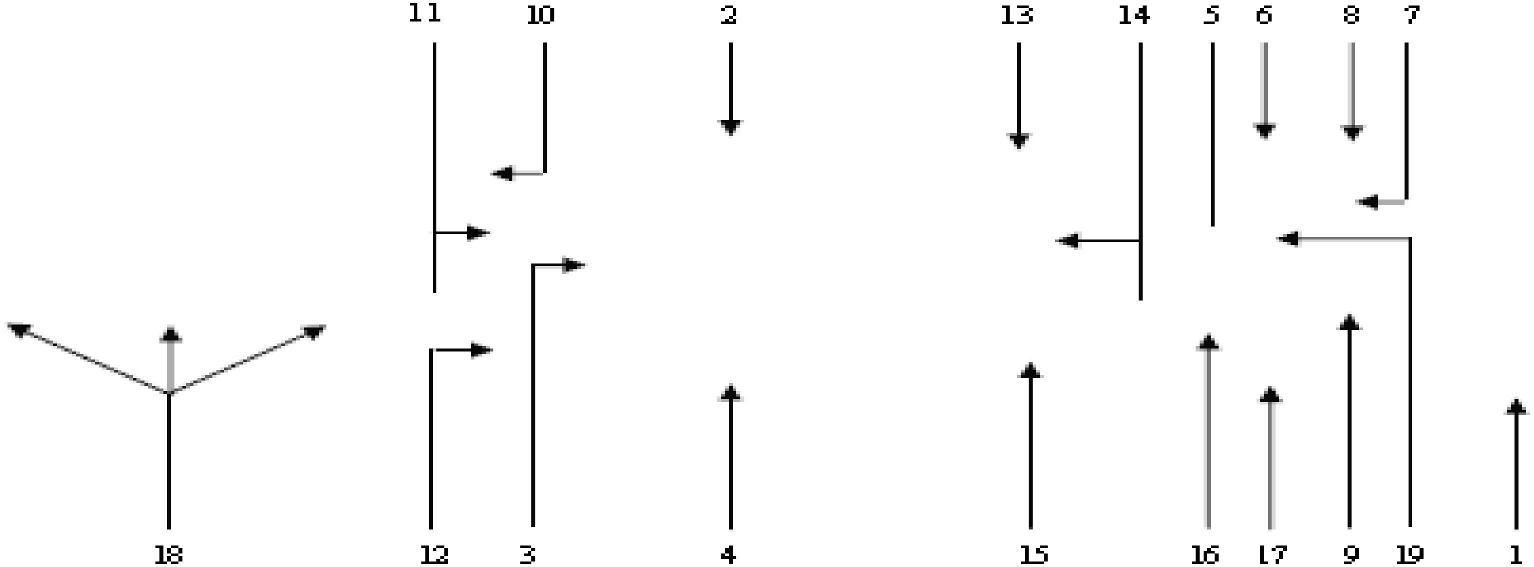
6. It is possible to change the set values during the run without depressing the STOP switch.
To change the output set values during the run, depress the increase or decrease tactile switch until the appropriate output set value is reached.
In START status, when the set switch is moved, the leds will display the output se values during three seconds and then switch back to displaying the actual outpu values.

7. To establish the limiting (constant) mode for the particular experiment, set the controlling parameter to the output desired, and increase the other output set value until the appropriate MODE LED (VOLT, MILLIAMPs) illuminates.

If the non-controlling output set values is reached during the course of the run, the power supply will automatically crossover to the new mode and control output relative to that mode. The appropriate MODE LED will illuminate.
If automatic crossover is desired during the run, adjust the output set value of the second controlling parameter to the maximum setting desired. When actual output relative to the second controlling parameter equals its output set value, the output will cross over from the first controlling parameter to the second.

8. When the set time is elapsed , the output is automatically shutdown.
Volt and mA display zero and timer shows the set time.
Wait one minute before disconnecting the power cords from the gel unit.
Turn the main power switch off when the unit is not in use.

Electrophoresis: ElChrom, Power Unit Controls



1	Main Power switch	Turns on unit
2	Voltage output Led	Display actual or set output in Volts
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4	Time in minutes	Display elapsed or set time in minutes
5	STOP switch	Terminates output
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15	Time increase/decrease	Increases/decreases time set mode
16	ON/OFF timer switch	Put timer ON/OFF mode
17	CLEAR switch	Cancel the elapsed time of a previous running
18	Output Jacks	Red = positive ; Black = negative
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Electrophoresis; Elchrom, Prep of Precast Gels pg 10-11 of manual

4. Preparation for Electrophoresis

4.1 Preparation of the Precast Gels

1. Choose the appropriate gel type for your application. Consult the "Find the Best Gel " and EL Quant program for most accurate gel selection: www.elchrom.com >Technical Resources>Tools
2. Remove it from its protective aluminium bag using scissors to cut open one side of the bag.
3. Carefully cut the inner polyethylene bag with scissors on three sides and peel away the foil from the gel. Grip the gel with the forceps at the plastic backing overhang.
4. Before running the gel, it is imperative to pre-warm the gel to the appropriate temperature. Follow the table below for directions:

Temperature	Pre-heating
9 °C	no pre-warming
20°C	bring to RT (20-30 min)
55°C	bring to RT (20-30 min) first, subsequently place onto catamaran inside prewarmed ORIGINS for ca.30 min.

Note: If you want to use only one section of a Wide Mini gel, carefully cut off the plastic backing between the gel sections with scissors. About 2 mm of plastic backing should remain on each side of the cut gel sections. Place the remaining gel sections in the polyethylene bag, seal it and put it back into the aluminium bag. Close the aluminium bag with the tape and refrigerate. The remaining gel sections should be used within two weeks.

4.2 Preparation of the TAE Running Buffer for Elchrom Gels

Elchrom gels require 30 mM TAE buffer. Elchrom Scientific is offering 1 litre of a 40 x stock solution of TAE buffer (1.2M), packed in 20 centrifuge tubes of 50 ml each. (P/N 3031)

Preparation of a 40 x stock solution of 30 mM TAE buffer

Components	Amount for 1 litre (40 X)
Tris (hydroxymethyl) aminomethane	145.37 g
$Na_2EDTA \bullet 2\ H_2O$	11.16g
Acetic Acid (glacial)	34.4 ml

Dissolve Tris and Na_2EDTA in 800 ml of distilled water.
Add acetic acid in a fume hood and adjust to 1 litre with distilled water.

Electrophoresis with this buffer should give the current values indicated in the Table of electrophoresis settings.

Table of electrophoresis settings

Temperature	Voltage	Resulting Current
20°C	120 V (10 V/cm)	350 mA ± 50 mA
55°C	120 V (10 V/cm	700 mA ±100 mA
9°C	108 V (9 V/cm)	250 mA ± 50 mA
9°C	72 V (6 V/cm)	170 mA ± 20 mA

Prepare 2 litres of the running buffer before starting electrophoresis
Dilute 50 ml of 40 x TAE stock solution (P/N 3031) to 2 l with dH_2O.
Pour 1.9l of the buffer into the buffer tank of the ORIGINS. Add buffer carefully to avoid buffer spillage.

The use of other running buffers with Elchrom Hydrogels will generate inferior results.

NEVER USE BORATE BUFFER. IT WILL MAKE COMPLEXES WITH THE GEL MATRIX AND DESTROY THE RESOLUTION COMPLETELY

Explanation: The composition of the buffer inside each Elchrom Hydrogel has been optimized to give the sharpest bands in 30 mM TAE running buffer.
The running buffer can be re-used about three times, depending on the type of experiments done. If you are worried about cross contamination, use fresh buffer for each experiment.

Running Buffer for PCR CheckIT gels:
PCR CheckIT gels contain 30 mM TAE buffer. We recommend running them in the same buffer. Alternatively, PCR CheckIT gels may be equilibrated against other running buffers (equilibration time is at least two hours with pump switched ON and pump delay of 0 min)

Example: If you want to analyze RNA with PCR CheckIT gels in MOPS formaldehyde, equilibrate the gel against MOPS formaldehyde buffer. Equilibration can be carried out in the ORIGINS, with the pump switched ON. To run PCR CheckIT gels in the presence of ethidium bromide, equilibrate the gels for at least two hours (overnight is better) against buffer containing 0.5 µg/ml ethidium bromide.

IMPORTANT: We strongly recommend adding 0.5 µg/ml ethidium bromide to the running buffer if you plan to re-use a PCR CheckIT gel.
Do not add ethidium bromide to DNA sample!

Electrophoresis; Capillary, Prep of Samples, Pg 12-13 manual

4.3 Preparation of DNA Samples

DNA Concentration
Optimal DNA concentration depends on the detection method. For Ethidium Bromide staining, the DNA amount per band should be 2-20 ng. For SYBR Gold (or SYBR Green) staining recommended amount of DNA per band should be 0.4-4 ng.

Important note:
When compared to self-made agarose gels, Elchrom precast gels require much less DNA and therefore a smaller sample volume can be loaded.
The samples containing unknown amount of DNA should be loaded at two dilutions, one being 10-fold lower than the other.

Loading volume

Optimal loading volume is:	4-8 µl
Maximum loading volumes are:	
Mini gel	18 µl
Wide Mini S-2x13, S-4x13, S-2x104	25 µl
Wide Mini S-2x25, S-4x25, S-2x104L, S-2x200	14 µl

We strongly recommend to mix DNA samples with Elchrom Scientifics' Sample Loading Buffer provided with the gels (1 ml of 5 x concentrated Loading Buffer in every box of gels). The recommend Loading volume is 5 µl (4 µl sample plus 1 µl sample Loading Buffer).

Important: To avoid band distortion; all samples should have the same salt concentration. Using Elchrom sample Loading Buffer will secure sharp bands. When samples contain too high salt concentration, dilute sample with double distilled water and add appropriate Loading Buffer concentrate to adjust it.

Note:
- Do not add more than 50 ng of DNA per band, i. e. DNA concentration should be less than 10 µg/ml per band. Overloading will impair resolution.
- SDS in sample (>0.01%) may impair resolution.
- Do not add EtBr to the sample. When using PCR CheckIT gels, add it to the running buffer instead

4.4 Preparation of the ORIGINS apparatus

1. Ensure that the On/Off button is OFF.
ORIGINS should not be started without running buffer in the buffer tank.
Never run the pump without buffer in the ORIGINS buffer tank.

2. Fill in 1.9 l of 30 mM TAE running buffer in the apparatus. Check the level indicator positioned on the left side.

3. Check if the electrical cable plugs fit your Power supply. The use of Power supplies of other suppliers may require an adapter, available from the supplier. Connect the ORIGINS apparatus to the Power supply by red and black cable.

4. Switch ORIGINS On/Off button ON. When ORIGINS is started, pump starts to circulate the buffer and digital thermometer is measuring the temperature. ORIGINS accepts the settings of the previous run and starts cooling or heating accordingly.

5. If you need to change the temperature check that the Time is OFF. With one of the horizontal arrows choose the function: Temperature and change the value for the temperature by one of the vertical arrows. Press SET button to confirm and to save the selected value. Pump should be switched ON.

BEFORE LOADING THE SAMPLES TURN THE PUMP OFF.
Check if the pump delay is set correctly (see the Table of Delay Time Settings)

Table of Delay Time Settings

Type of the gel	Voltage Applied*	Pump delay 1.5 min	4.5 min	12 min
Spreadex Gels	120 V, 55°C	x		
Spreadex Gels	120 V, 20°C		x	
Poly(NAT) Gels	120 V, 55°C	x		
6% Poly(NAT) Gels	120 V, 20°C		x	
PCR CheckIT Gels	120 V, 20°C	x		
PCR CheckIT EB Gels	120 V, 20°C	x		
Self Made Agarose Gels (< 2.5 %)	> 84V, 20°C	x		
Self Made Agarose Gels (> 2.5 %)	< 84V, 20°C		x	
GMA	72-84 V/cm, < 10°C			x

* distance between electrodes = 12 cm (10V/cm)

Electrophoresis; Elchrom Mode of Operation , pg 14, 15 Manual

5. Mode of Operation

5.1 Running the Precast Gels

1. **Prepare the 30mM TAE buffer.** Fill the apparatus with 1.9 l 30mM TAE buffer, 2-3 mm above the upper electrode.

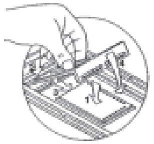
2. **Set-up the buffer to appropriate temperature.** During setting, Time should be OFF. Temperature is changed by one of the vertical arrows and saved by pressing SET button.

3. **Select and prepare the gel for electrophoresis.** Elchrom Scientifics' precast gels are ready to use. You only need to remove them from the packaging and pre-warm accoding to table on page 10.

   Cut the aluminium bag on one side. Take the plastic bag with the gel out, and cut the plastic bag on 3 sides. Peel the plastic off. Grip the gel with forceps at the plastic backing overhang.

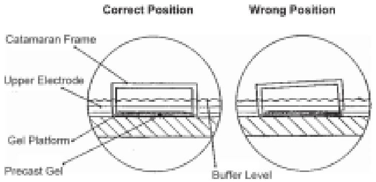
4. **Place the gel into the ORIGINS unit.** Turn off the pump. Hold the gel with forceps at the plastic backing overhang. Make sure that no air bubbles are trapped under the plastic backing or in the sample wells. One Wide Mini gel presentation (all gels from one aluminium bag) or 3 Mini gels (8 samples each) can be run simultaneously.

5. **Insert the Catamaran frame (Gel holder).** Select the appropriate Catamaran frame for your gel type to fix the gel in the center position in the apparatus. Insert one side of the Catamaran into the ORIGINS (2). Move the side close to and alongside the gel (3).Lower the other side of the Catamaran down until it rests on the plastic backing overhang (4). The gel can be moved closer to the anode or cathode by pressing a needle on the backing overhang and pushing in desired direction.

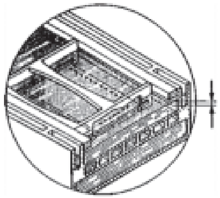


IMPORTANT when using Wide Mini S-4x25 and S-4x13 gels. The gel must be positioned such that the channel that separates the S-4x25 and S-4x13 gel sections is in line with the opening in the sides of the Catamaran S-50/100. This is necessary to ensure optimal buffer flow through the channel to wash away the DNA exiting the upper gel section.

6. **Check the correct Catamaran position.** Its sides must rest on the plastic backing overhang in the center of the chamber and not on the gel . Sample wells need to be parallel to the electrodes.



7. **Adjust buffer level.**



Buffer level should be about 2-3 mm above the upper platinum wire (see blue marked level on the left side). Remove excess buffer with a 20 -50 ml syringe if necessary

8. **Load your samples. Prior to loading switch off the Pump.** Load samples with a 1-20 µl pipette. Optimal loading volume is 4-8 µl. The width of the sample wells is wide enough to allow the loading using standard pipette tips.

Electrophoresis; Elchrom Mode of Operation, pg 16-17 manual

Wide Mini gels. Samples can be loaded with a multichannel pipet. The wells in the Wide Mini gels are spaced such that alternate wells are loaded in a given pipetting step. 100 samples can be loaded on a Wide Mini S-4x25 gel in just 8 pipetting steps using a 12-channel pipette to load 96 samples, and a standard pipette to load size markers.
If you have difficulty in seeing the sample wells (PCR CheckIT gels), pipette some loading buffer over the area where the wells are, wait 10-20 sec and then rinse the sample wells with buffer. The dye that has diffused from the sample wells into the gel makes the sample wells readily visible.

9. **Close the unit.** Close the lid and connect the cables to Power supply (P/N 2029 PSE).

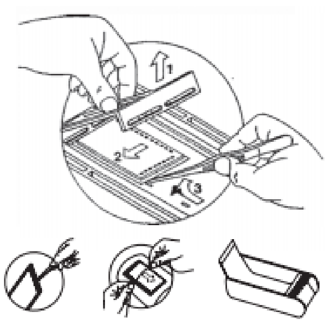
10. **Select the Pump Start Delay Interval.** In order to allow the DNA samples to enter the gel without being disturbed by circulating buffer, the pump has to start with some delay after the voltage is turned on. Set the interval of the Pump Delay according to the gel type and voltage settings as given in Table on page 13.

11. **Start electrophoresis.** Set the appropriate voltage and running time on the Power supply and turn on the power. Switch the Time on ORIGINS display to ON. The Pump Delay Controller will automatically start the pump after the preset delay time.

IMPORTANT: Never run gels in the ORIGINS without buffer recirculation.

12. **Stop electrophoresis.** The run stops automatically when using the Power Supply with the timer. After the time on ORIGINS elepses, ORIGINS gives an alarm signal.

13. **Remove the gel.** This can be done by sliding the gel with the help of the Catamaran (1) and the forceps provided (2). By using a needle gel is pulled up. Grip the gel firmly at the plastic backing overhang with forceps (3) and transfer it into the „Easy-stain" gel tray (P/N 2344) upside down (surface is facing bottom of tray).



14. **Stain and photograph the gel**
Stain Elchrom gels after electrophoresis with ethidium bromide, SYBR Green or SYBR Gold (or any other standard fluorescent dye). Removal of gel backing is recommended to shorten staining/destaining times. The background is improved and destaining is shortened, when Elchrom's destaining solution is used (P/N 3037).

5.2 Running Spreadex and Poly(NAT) Gels at Elevated Temperature

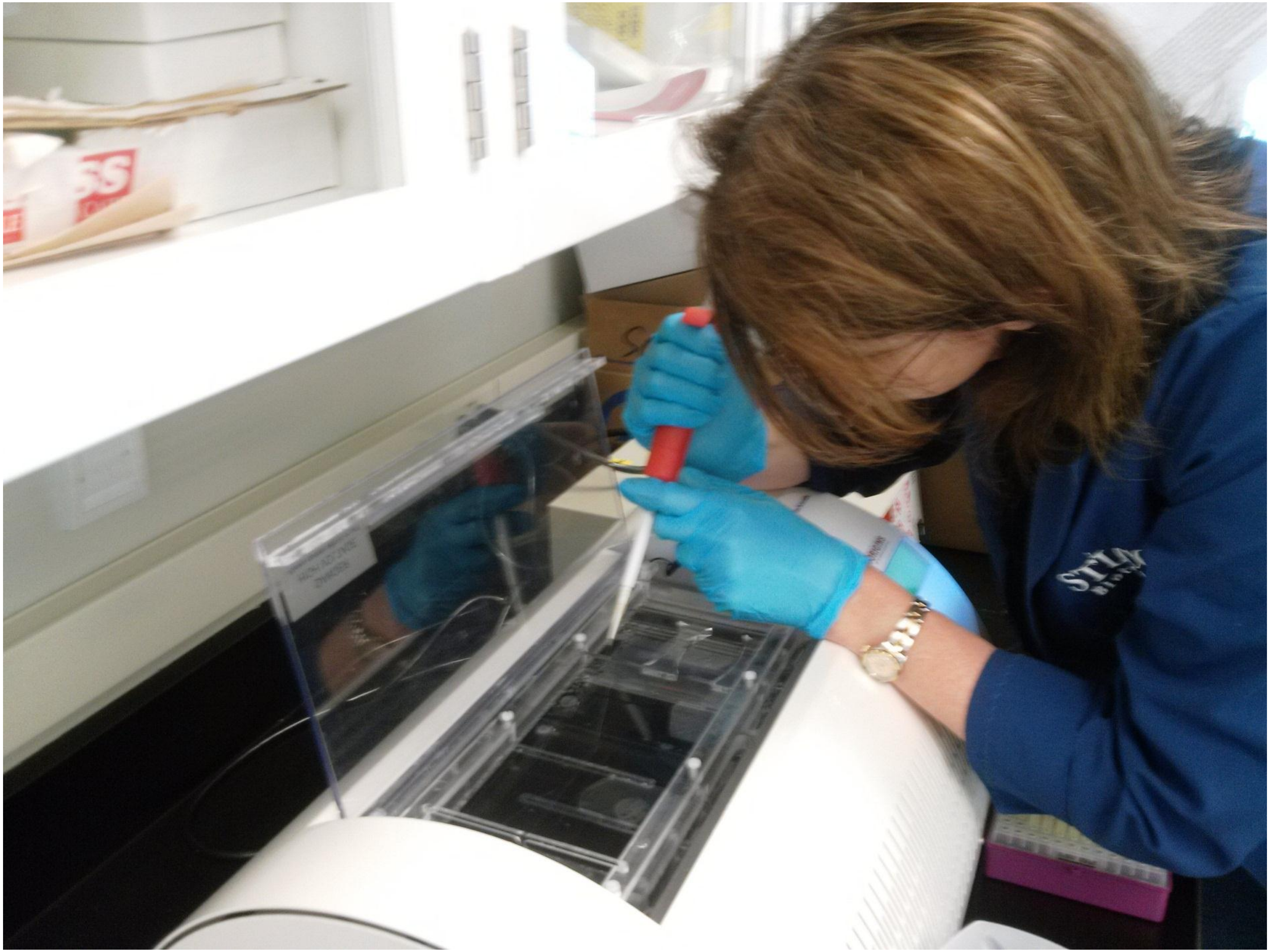
Electrophoresis of Spreadex and 9%, 12% Poly(NAT) gels at 55°C reduces the running time by a factor of two, and also greatly suppresses anomalous, sequence dependent DNA mobilities. For 55°C working temperature gels need to be pre-warmed for 20-30 min to RT and subsequently to 55°C for 30 min. When this is omitted, air bubbles sometimes appear in the gel during a run, disturbing the band pattern.

Warming is performed by placing a gel ON the Catamaran frame in the ORIGINS, NOT into the running buffer.

5.3 Exchanging the Running Buffer

To exchange the buffer, connect the associated emptying silicon tube to the emptying nozzle on the left side. The liquid flow begins immediately. Take care that the end of the emptying tube is placed in the collecting tank so that the buffer flow can be executed save. If it contains ethidium bromide, we recommend the use of Elchrom Scientific's Bind ET System (P/N 2350) safest and most ecological Ethidium bromide removal system.
For thorough cleaning of the unit, fill it once with deionized water and recirculate it for about 5 min. Discard the water and refill the unit with buffer.

Electrophoresis: Elchrome, Load Samples



Electrophoresis: ElChrom, Short Manual, GMS gels at 9C. Pg 1/2

Running Elchrom ready-to-use GMA™ gels for SSCP in ORIGINS by Elchrom® at 9°C

1. **Prepare 30 mM TAE buffer** *(Fig. 1)

2. **Fill the apparatus with 1.9 l 30 mM TAE buffer 2-3 mm above the upper electrode**

3. **Switch the ORIGINS ON by ON/OFF button. Set the Temperature to 9°C. Set Pump Delay to 12 min. Set the Time. Every value has to be confirmed by pressing SET button.**

4. **Prepare the samples:**
   A) Add 3 µl PCR product to 7 µl formamide-NaOH stock solution*. Mix well.
   B) Heat the samples at 95°C for 5-6 min and quickly place the tubes in ice-cold water for 3 min.

5. **When samples are ready, take the gel** *(Fig. 2) **place it in the ORIGINS by Elchrom and fix it with the catamaran frame** *(Fig. 3, 4)

6. **Switch the Pump and the Time OFF. Load 9 µl of the samples quickly and close the lid**

7. **Start Power Supply and Time on ORIGINS ON**

8. **When electrophoresis is completed, take the gel out using the forceps** *(Fig. 5) **and the needle**

9. **Place the gel on the Peel-IT™ and detach it from the plastic backing with nylon string, for faster staining or blotting** *(Fig. 6)

10. **Stain the gel in the Easy Staining tray on the shaker** *(Fig. 7)

Electrophoresis: ElChrom, Short Manual, GMS gels at 9C. Pg 2/2

1. Dilute 50 ml of 40xTAE stock solution (PIN 3031) to 2 l with dH_2O. *(Fig. 1a)*

2. The level is marked on the left side of the ORIGINS. *(Fig. 1b)*

3. Set temperature to 9°C.

1. Move the cursor to set temperature value
2. With up and down arrows choose the temperature of 9°C.
3. Press SET button to confirm settings.

Settings are saved for subsequent runs!

4. Mix 1 ml formamide and 10 µl 1M NaOH just before use. A few grains of bromphenolblue may be added for better visualisation.

A) Ratio of PCR product and denaturating stock solution can be changed depending on the DNA concentration (e.g 1µl PCR + 9 µl stock solution)

5. Cut the alu bag on one side. Take the plastic bag with the gel out, and cut the plastic bag on 3 sides. Peel the plastic off. Grip the gel with forceps at the plastic backing overhang *(Fig. 2)*. Place the gel in the ORIGINS and fix it with catamaran frame *(Fig 3)*.

Catamaran frame should be placed on the plastic backing overhang, not on the gel *(Fig. 3, 4)*. A needle can be used to move the gel. Rinse the sample wells with pipettor if air bubbles are present.

6. Switch the Pump and Time OFF before loading the gel. For loading Wide Mini gels a Multichannel pipettor is recommended.

7. Recommended voltage is 72V 6 V/cm; cm = Distance between the electrodes. Amperage is always set to maximum. Running time depends on PCR fragment size:

Size in bp	150-200	200-250	250-350	350-450
Time in h	10	12	15	17

Start the Power supply (72V) and then start Time ON on ORIGINS

8. To remove the gel use a needle to lift the edge of the gel. To avoid damage to the electrodes always move the gel parallel to the long axis of the apparatus to avoid damage of electrode wires.

9. Nylon string is provided in every box of gels. Instead of Peel-IT™ *(Fig. 6)*, any 1 or 2 l glass bottle can be used. Bottle need to be fixed to stay in place.

10. Stain with SYBR Green II or SYBR Gold (1:10000) diluted in 30 mM TAE buffer for 20-30 min. It is recommended to protect the gel from the light during staining. Cover the Easy Staining tray *(Fig 7)* with the cardboard box or aluminum foil. Destain in distilled water for approximately 30 min is recommended when the gel is overstained.

40x CONC. TAE BUFFER: (P / N 3031)

Components	Amount for 1 liter
Tris (hydroxymethyl) aminomethane	145.37 g
$Na_2EDTA \cdot 2H_2O$	11.16 g
Acetic Acid (glacial)	34.4 ml

Fig. 1a



Fig. 1b



Fig. 2



Fig. 3

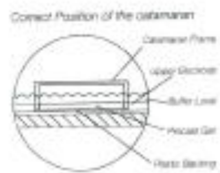


Fig. 4

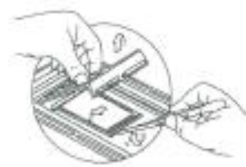


Fig. 5



Fig. 6



Fig. 7

Running Elchrom ready-to-use GMA™ gels for SSCP in ORIGINS by Elchrom® at 9°C

Electrophoresis: Elchrom Gels, Distributor Jan2012

Sent: Monday, December 17, 2012 10:05 AM
To: Taylor, Angela M.; BioLynx Sales; BioLynx Quotations
Cc: Boedeker, Elizabeth D.; Hill, Jennifer S.; Barban, JoAnn L.; Norris, Richard J.; Morrison, Robert G.; Staerk, Becky K.; Gaetane Denechaud
Subject: RE: Biolynx Inc - Set Up As New Vendor - W9 Needed

Good morning Angi,

MJS BioLynx Inc is now the Distributor of Elchrom products in the United States. We appreciate you contacting us. Our Accounting Dept. will be sending an email with the information required to set up an account to purchase from us. Please note the email address will be “@chromspec.com”, Chromatographic Specialties Inc. is our sister company.

Our quotation dept., quotes@biolynx.ca will be happy to send you pricing when you are ready to proceed, please include the Elchrom part number if available. In addition, our sales dept., sales@biolynx.ca will process your orders and send confirmation via email.

Our team would be pleased to provide you with any information you require. For more information regarding MJS BioLynx Inc., visit our website at www.biolynx.ca

I am a contact within the office to answer any questions you may have.

Sincerely,
Gaëtane Denechaud

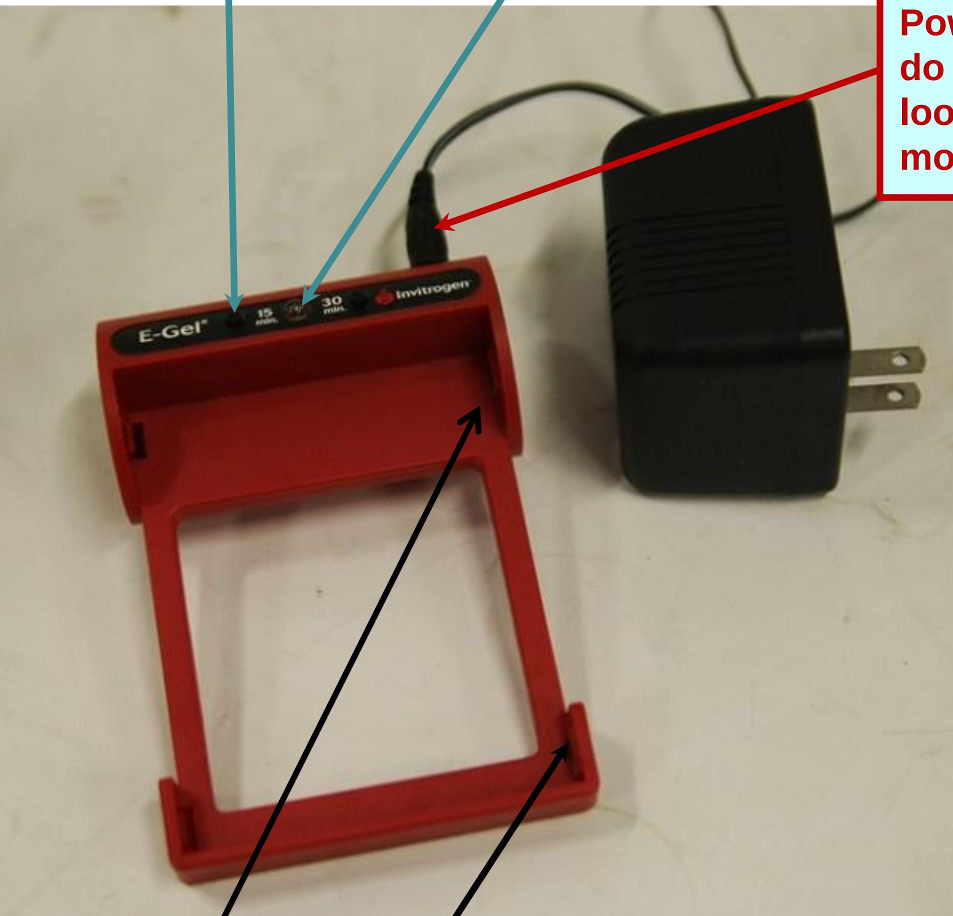
Gaëtane Denechaud
Customer Service Coordinator - Coordinatrice du Service à la Clientèle
MJS BioLynx Inc. www.biolynx.ca
1-613-498-2126 ext. 327
Toll Free in Canada - Sans Frais au Canada
1-888-593-5969
gaetaned@biolynx.ca

Electrophoresis: E-Gel System, Powerbase V4.0

15 and 30 min control buttons

Observe Status light per instructions on next page

Power plug must fit securely in slot. If status lights do not show with an E-gel in place, the plug may be loose. Use pliers to crimp the circular plug to a more elliptical shape to tighten the grip in the slot.



ETHROG or **Invitrogen E-Gel Power Base , Ver 4**
Invitrogen E-Gel Power Base, self-contained unit with a AC/DC adaptor that plugs directly into a wall
Powerbase outputs 8.8-9.0VDC and maintains a current of 38-42 mA
15 min. and 30 min timed program so that it will shut off automatically when electrophoresis is complete. E-Gel Pre-Cast Agarose Gel Electrophoresis System

Link to Egel Powerbase User Manual (pdf)

Make sure both base pole electrodes are clean. Scrape if necessary.

Secure E-gel Agarose packet by inserting right side first, then snap left side into place.



E-Gel Agarose 1.2% typical

Electrophoresis: E-gel Basic Operations

1. **Before putting an E-gel cartridge in the powerbase**, attach the circular end plug of the power adapter cord into the hole in the base and then plug the adapter itself into the 110V outlet. A brief self-test of flashing lights and beeping will occur, then no lights until step 2 is completed.
2. Insert the E-gel cartridge into the base right side first, then press the left side down. There should be an click sound as the cartridge snaps into place and a **steady red light will appear (Ready Mode).** No button pushes are required to reach this state.
3. ***A two minute "pre-run" with the E-Gel comb in place is required before you will load samples into the wells.*** Press and hold either the 15 or 30 min button for a few seconds as the **steady red light** turns into **a flashing green light for the 2-minute run.**
4. At the end of the "pre-run", the flashing green light will turn to flashing red and a rapid beep will sound. Press and release either button to stop the beeps and return to a steady red.
5. Remove the comb from the E-gel cartridge carefully lifting straight out and then clear up any gel residue near the wells.
6. Prepare and load your samples into the wells per the E-gel manual guidelines.
7. For a single-comb gel, press the 15 min button, **a steady blue light will appear for the duration of the run.**
8. For a double-comb gel, press the 30 min button, a **steady green light will appear.**
9. *You may interrupt the run at any time by pressing either button once and then again to restart but you must manually time the remaining portion to avoid overrunning the gel.*
10. At the end of the run periods, the steady light will return to a flashing red light and beeps will sound. Press either button to stop the beeping and return the light to a steady red.
11. Remove the E-gel carefully from the powerbase and you are now ready for the transilluminator and/or other analysis. Bands will diffuse within 20 minutes however!

Electrophoresis: E-Gel Rig, BRDG, Ethrog Biotechnologies



Purchase through Fisher Scientific:
S11191ND
Ethrog Biotechnologies
No.:65-0017

A base and power supply together in one piece.

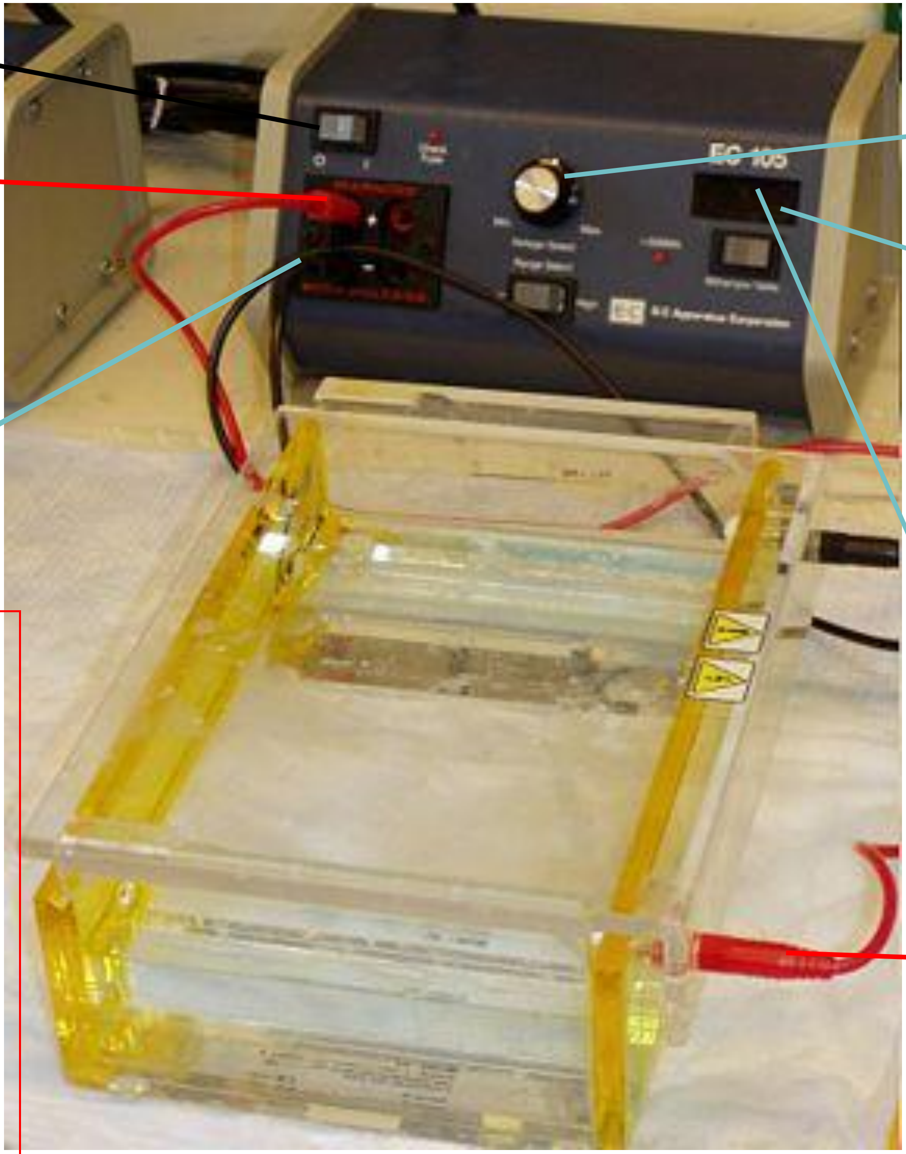
Lighted display indicates when the two-minute pre-run is complete and when to load samples.
See details
Includes: Power cord and manual
Required Accessories: Double-comb or single-comb E-Gels

Electrophoresis : Typical Gel Setup

On/Off

Red (+) Electrical Probe; leads to far or receiving end of plate. If lose or pops out, expose metallic end and expand thin strips.

Black (–) Electrical Probe; leads to well or start end of plate



Voltage or Amps dial control. Typically set to maintain 95 volts during run.

Digital Volt or Amp readout Window

Rocker Switch: Set to constant Volts (or Amps) per lab procedure. Typically 95 Volts DC.

Safety Notes:

1) ***Connect all wiring and probes before turning the unit on.***
2) ***Never touch the probes or power supply box while the device is on.***
3) ***Turn off the device before disconnecting electrical probes.***
4) ***Do not handle the device with wet hands or on wet countertop.***

Red + Electrical Probe; goes to far or receiving end of plate.

Note, if probes become lose or pop out , expose the metallic portion and expand the thin metal strips to increase friction in the female socket.

Electrophoresis;
Typical Instructions and Guidelines

1. Place the cover on the electrophoresis unit, making sure to have the negative (black) electrode at the well end of the gel.

2. Insert the electrode cords into the proper inputs of the power supply. Set the power supply on ‘low’ and turn it on. Set the voltage at 90-95 volts. Check to make sure bubbles are forming in the buffer on the platinum wire electrodes along the ends of the gel box. Watch the gel closely for 2 – 5 minutes to make sure that the dye is migrating in the correct direction.
3. **If you hear an audible alarm or any of small red lights (Fuse or >500mA) come on during the run, turn off the unit immediately and unplug. The audible alarm and overcurrent lights indicate potential breakdown of the gel mixture or higher than normal temperatures in the gel. For further information on Voltage, Current, and Resistance, see the following slides.**
4. **If the Gel Rig Electrode/probes pop out or become lose during the run. Turn off and unplug the Power Supply and remove each electrode. Inspect each electrode probe end by exposing the metallic portion. Use a sharp tool to “spring” the thin strips on the metallic probe ends to create a better grip in the power supply female sockets.**

5. Allow the tracking dye to migrate 4-5 centimeters from the wells so that the molecular weight marker fragments separate sufficiently.
6. Turn off the power supply, unplug it, and disconnect the electrodes from it. Then remove the lid from the gel box.

Electrophoresis: Horizontal, Mini, Owl-Series, 400ML



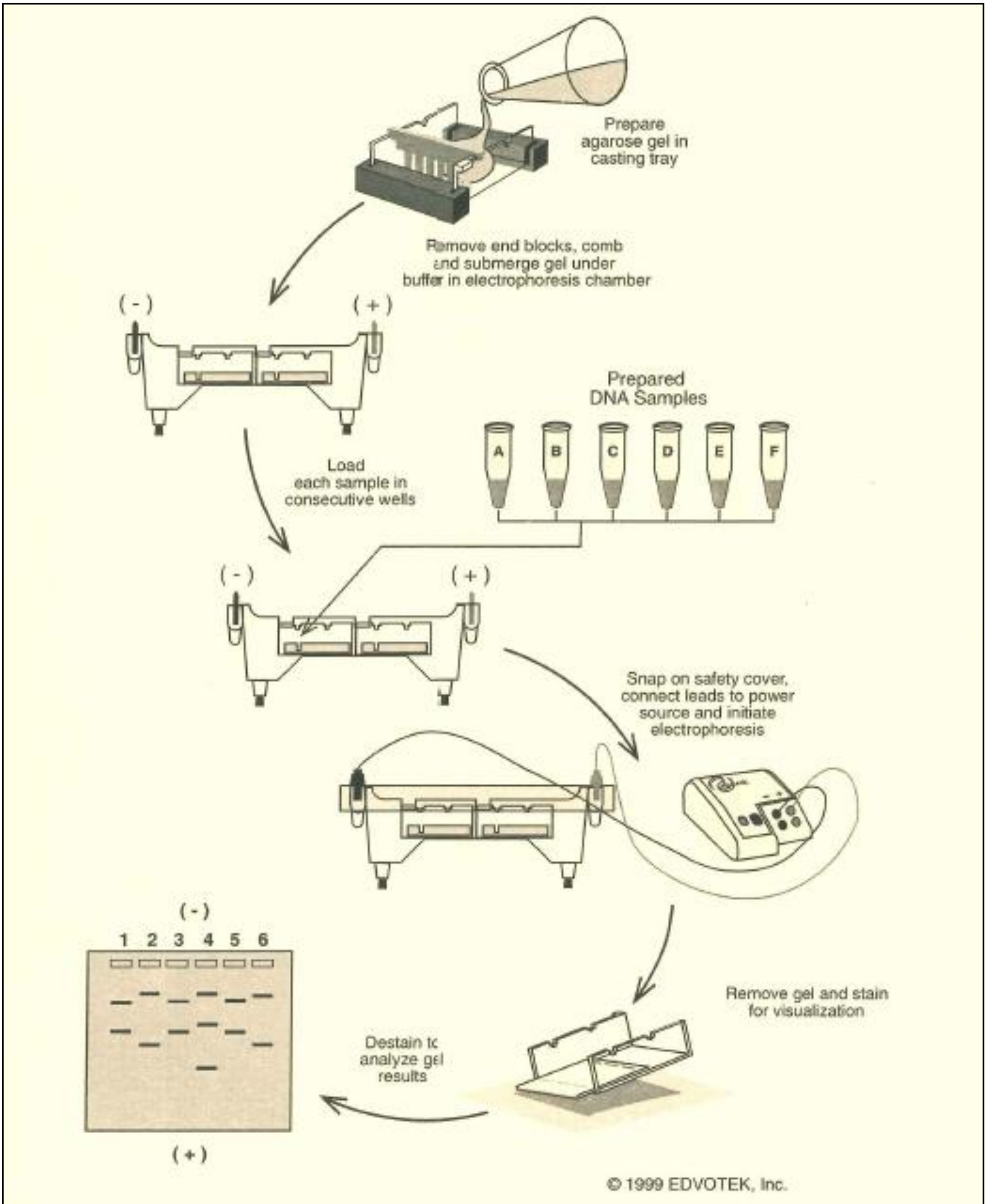
Mini-Gel System 400 ML
Size 16 x 9.5 x 8 (65/16 x 33/4 x 35/32) 8 x 7 (35/32 x 23/4)
Thermo Sci # B1A
VWR # 27372-226

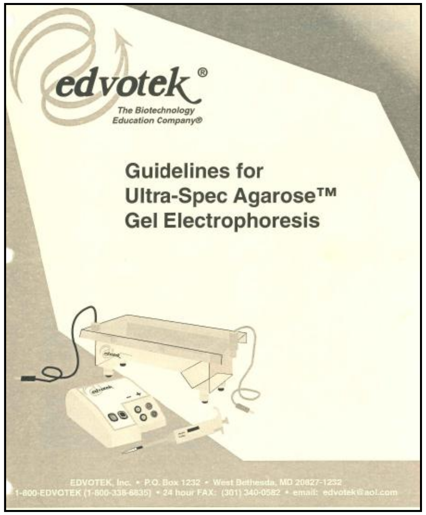
Mini-Gel systems have a small footprint and can run 5–34 samples (for 400 and 600mL systems) or 8–48 samples (for 800mL systems) on one gel. The buffer chamber features lane visualization strips, which are silkscreened on the platform to provide a clear view of sample wells. Lane markers and fluorescent rulers provide accurate fragment size determination of DNA when compared to known standards. Durable acrylic construction and research-quality components give the buffer chamber a long life. Platinum electrodes and gold-plated banana plugs are corrosion-protected, and electrode placement ensures a uniform electric field.

Leak-resistant, gasketed ultraviolet transmission trays allow tape-free casting in the buffer chamber. The trays have two comb positions and allow DNA bands to be viewed on a transilluminator without removing the gel. Optional multiload UVT trays have 12 slots for multiple sample-running, and allow samples to be loaded directly from a 96-well plate into an agarose gel. This design is based on the fixed spacing required to accommodate multichannel pipets (at least eight channels) and 96-well plates.

Heavy-duty, one-piece combs eliminate the need for comb assembly. The SuperSafe* safety lid eliminates the risk of accidental shock. System is supplied with a 0.91m (3') safety power cord, attached.

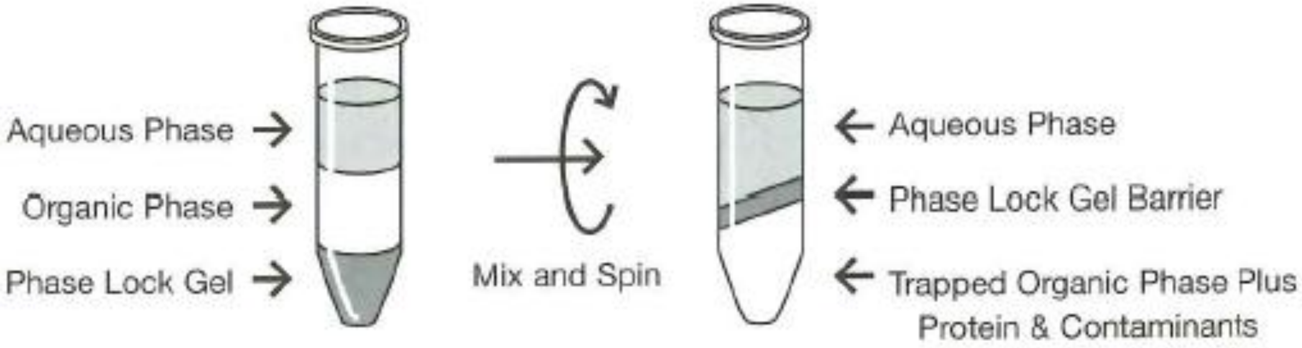
Electorphoresis: Agarose Gel Guidelines, Edvotek Kit

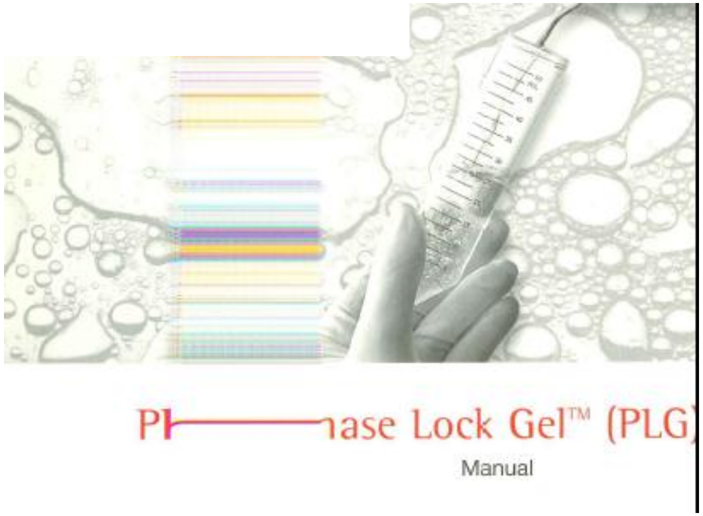




Hotlink to Edvotek Guidelines for Gel Electrophoresis …. Pdf (24 pgs)

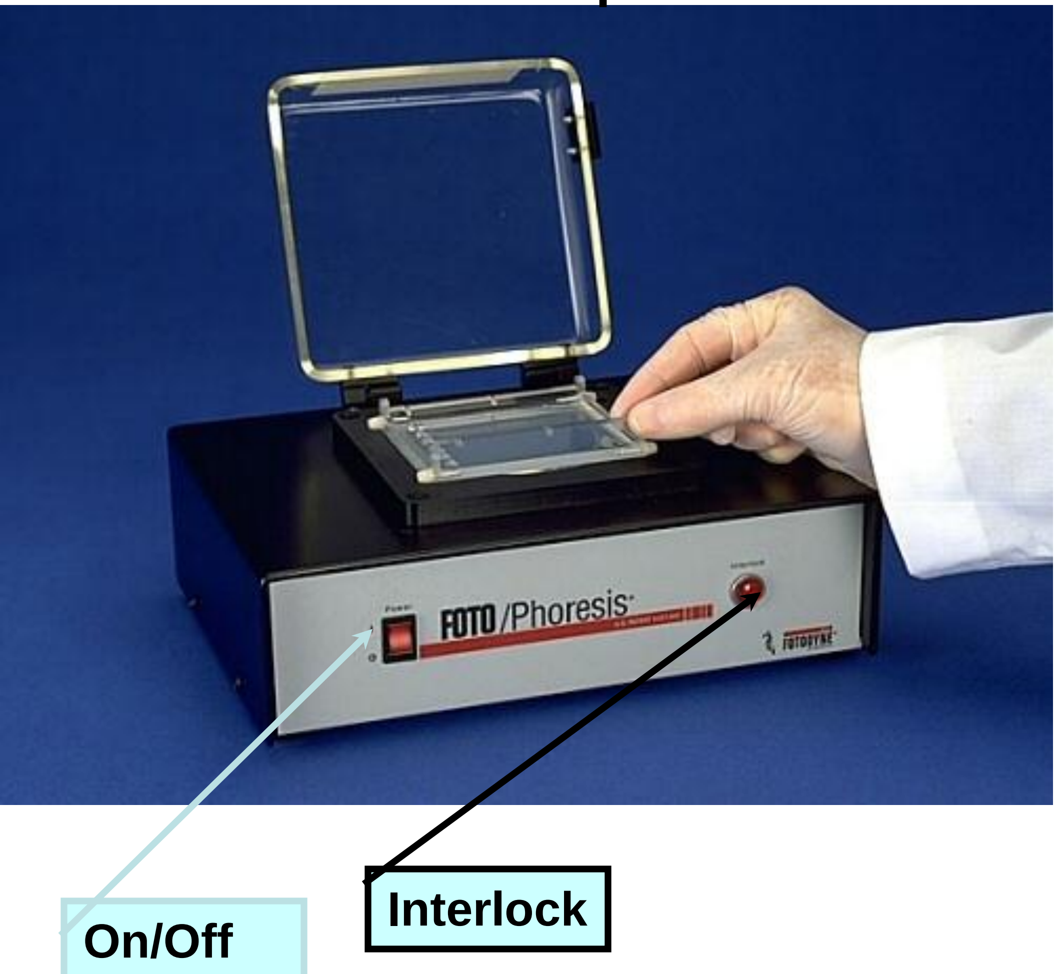
Electrophoresis: Phase-Lock Gel (PLG), Eppendorf Manual





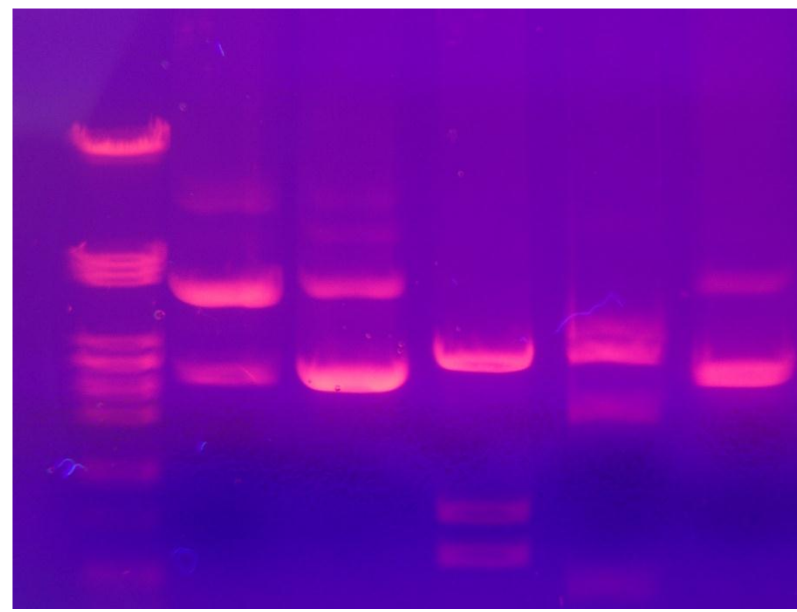
Hotlink to Eppendorf Phase-Lock Gel manual …. Pdf (24 pgs)

Electrophoresis: FOTO/Phoresis Operation



- 8.6 x 10.8 cm viewing surface
- UV Blocking Cover with interlocking safety switch and indicator light
- Perfect positioning of mini-gels for photodocumentation
- Notched acrylic viewing frame for holding standard Petri plate
- Two 9-watt, 300 nm bulbs
- Cooling fan

•Replacement Bulbs: 300 nm, 9 watt, 5-7/8" pin-to-pin (**E11-2122)**



Electrophoresis: Transilluminator-UVP-LM26



Transilluminator; UV; Benchtop; LM-26; 2UV; Single Intensity; 100-115V, 8w, Midrange; Wavelength 302/365nm, E-Ballast; Purple Base; Stainless Steel Filter Assembly; 21 x 26cm filter surface; w/UV blocking cover; 9.5D x 13.25W x 4.75&Pr

Includes: UVG 5000 hour long-life filter and hinged UV blocking cover with adjustable height

On/Off

UV Blocking cover lid, detachable for cleaning

Analog dial, set at 302 or 365nm

Gel Cutter Tool: UVP85 0002 01 Ultra Violet Products No.:85-0002-01

Electrophoresis: UV Transilluminator, BRDG,

VWR#

MINI UV TRANSILLUM TM-10 115V, 21476-040 Supplier UVP



Transilluminator, Benchtop Model M-10E, 6W. Single intensity for detection of nucleic acids in all gel documentation applications.
UVG* filter decreases solarization.
UV blocking cover included.
Wavelength: 302nm UV.
Filter size: 10x10cm.
11.4Hx26Wx18.4Dcm. 115V, 60Hz. ETL, ETLc certified.

On/Off

UV Blocking cover lid, detachable for cleaning

Analog dial, set at 302 or 365nm

Electrophoresis: FOTO/Phoresis Minivisionary System

Simple, Inexpensive Thermal Prints—No Computer Needed
MiniVisionary Workstations are designed to simply and rapidly document electrophoresis gels in both research and educational laboratories.

These stand-alone CCD-based imaging systems allow the acquisition of very low light fluorescent gels. Inexpensive thermal prints can be produced for about 1/10 the price of conventional film with the touch of a button.

Camera, Hood, and Filters
- Receives power and commands from Minivisionary Controller
- Sends video signal to Thermal Printer for copies

Fotodyne* FOTO/Analyst* MiniVisionary FD62310 System Photodocumentation, FOTO/Analyst MiniVisionary Hood Mount System; CCD camera; Hood; Controller; Ethidium bromide/coomassie; blue/methylene blue filters; Thermal printer; Cable; Support frame; 120V 60Hz



Minivisionary Controller
-set # copies, then use this PRINT button
- Automatically sends commands to the Thermal Printer

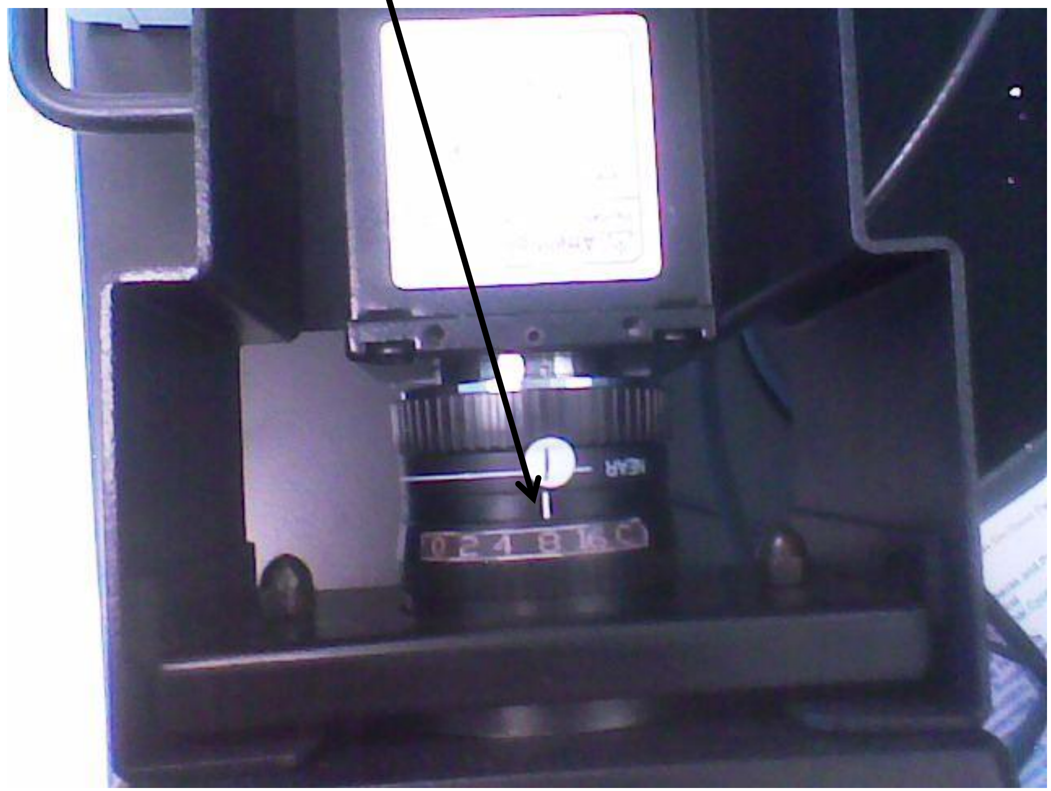
Thermal Printer
-Gets commands from controller (PC or Minivisionary)
- Has options for brightness and multiple copies

Link to Fotodyne Brochure on Minivisionary .. pdf

Electrophoresis: FOTO/Phoresis, Focusing and Aperture on Camera

Focusing: Adjust focusing and aperture on camera to align with markings on the dial as shown below. A target of “8” seems to work well for the Fotodyne unit at BRDG.





Electrophoresis: MITSUBISHI P93W Monochrome Printer

Copy: Use ONLY if you want to set Multiple copies from each press of the PRINT button on the Minivisionary Controller.



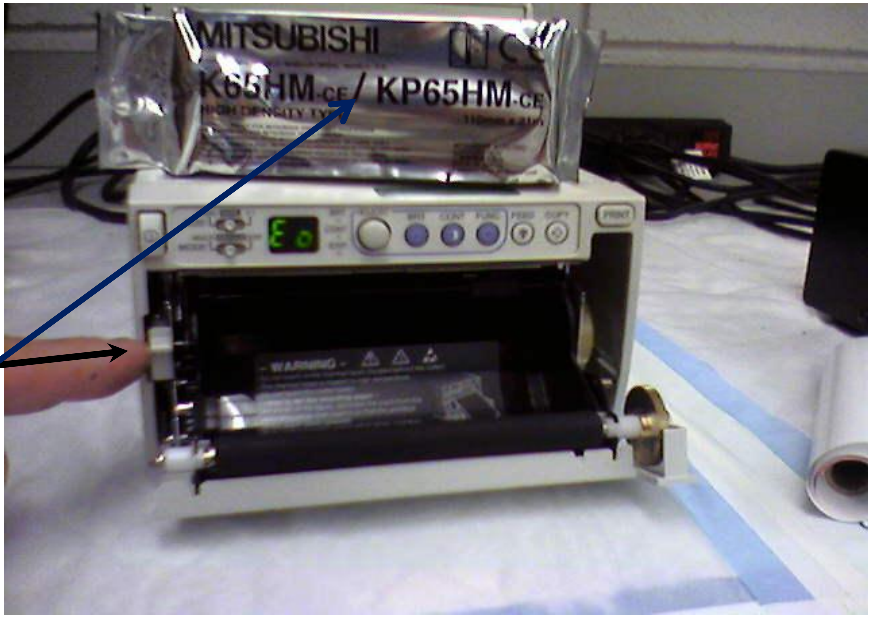
Paper replacement, press to open door, see next slide for details.

Print Method Thermal printing on thermal paper
Dot Density 325 dpi (12.8 dots/mm)
Resolution (NTSC)1280 x 500 dots
(PAL)1280 x 600 normal
Greyscale 256 levels
Interface BNC (input and output)
Memory 10 Frames
6 image sizes Normal, Side (landscape), Multi-Normal, Multi-Side, Square (1:1) and expanded (x 0.5 to 2.0)
Print Capacity Normal - Approx. 260 prints (paper save mode)
Side - Approx. 150 prints (paper save mode)
Square (1:1) - Approx. 195 prints (paper save mode)
Normal Size 3.3 Sec. NTSC, 3.9 Sec. PAL
Side (landsacpe) 8.4 Sec. NTSC, 8.4 Sec. PAL
Picture Size (Normal) Approx. 3 x 4 inches
Picture Size (Side) Approx. 4 x 5.2 inches
Picture Size (Square) Approx. 4 x 4 inches
Dual Power Supply AC 100-120V, 50/60 Hz
AC 220-240V, 50/60 Hz
Power Consumption 1.5 to 0.8 amps
Dimensions (W x D x H) 6 x 9.8 x 3.5 inches
152 x 249 x 89 mm
Weight 6.16 lbs. (2.8 kg)
Regulatory Approvals UL2601-1; CAN.CSA C22.2 No.601-1(C-UL), FCC-Class A, TUV GS, TUV GM; CE Mark (EMC; 89/336/EEC)

Fisher Scientific Catalog:
Paper, Thermal Printer, Fotodyne; Approx. 260 prints/roll; 3 x 4 in. (7.6 x 10.2cm); Accessory for MiniVisionary Printer

FD602012 Fotodyne No. :60-2012

Electrophoresis: Thermal Printer Paper Replacement



1) Press to open printer door
2) Locate KP65HMce thermal paper in the cabinet above printer. Open foil and place in carousel with end at top of the roll



3) Insert new paper roll with shiny face on outside, whiter flat face on inside of roll
4) Extend paper 2cm outside of cut edge
5) Close door and resume printing

Electrophoresis: PhotoDoc-It System

MIDSCI Cat #: 97-0274-04
PhotoDoc-It System, w/M-20V
Transilluminator, 20x20cm,
Variable Intensity



DigiCam 60:
- Color digital camera
- 10.0 megapixels
- SD memory card (16 MB minimum)
- Power cord included (batteries not required)

Darkroom:
- UV blocking viewer window
- Lightweight and compact
- Handles for easy transport of the hood
- Fits on top of the transilluminator

Emission Filters
- EtBr Red 570-640nm

Transilluminator
- The system is designed for use with UVP's Benchtop UV Transilluminators
- Select from 302nm UV or 2UV model with 302nm and 365nm
- Filter sizes: 20x20cm or 21x26cm
- M-20V and M-26V feature variable intensity settings

Color Printer
- 300 x 300 resolution
- 4x6 in. prints
- USB connectivity
- 108 prints included
- Dimensions: 7 x 5 x 2.5 in. (178 x 127 x 64 mm)

Combination Lock:
- 3 digit resettable combination
- 2 ft. cable

Dimensions: 17H x 13.25W x 9.5D in. (432 x 337 x 241mm)

Electroblotter: Semi-Dry, Ellard HEB 2020



The HEB 2020 accepts gels up to 20 cm x 20 cm. Completely enclosed lid and drip retaining base. For safety power leads must be disconnected to open unit. Color coded lid, base and leads prevents reversal of polarity. Solid construction of 3/16 inch red and 1/4 inch black acrylic, 3/8 inch laminated base with 1/4 inch thick graphite plates.

Advantages of Horizontal Semi-Dry Electro-Blotter
Transfer time, one hour at constant 0.8mA/square cm at room temperature.
Increases capacity to six gels.
Reduces Buffer Requirements to only 200 ml.
No cooling required.
Standard power supplies can be used.
Safety Cover.

RELATED INFORMATION: VWR Catalog Website
Owl Series Semi-Dry Electroblotters, Thermo Scientific
Supplier: Thermo Scientific

Rapidly transfer proteins or nucleic acid molecules from polyacrylamide or agarose gels to membranes. Reduce Southern, Northern, and Western blotting times to less than one hour.

Solid plate platinum/titanium and stainless steel electrodes are highly conductive and allow transfers at low voltages without external cooling systems. Plate electrodes provide a uniform electric field for efficient, even transfers.

Lid and attached power cord are safety-interlocked to prevent electric shock. Lid is designed to ensure proper orientation of electric field.

Minimal buffer is needed for accurate transfers; the amount contained within the blotting filter paper is sufficient. Easy-to-turn knobs allow uniform pressure to be applied across the entire blotting stack for even transfers.

Use electroblotter 27372-374 for mini- to full-size gels. Unit is designed specifically for the transfer from polyacrylamide or agarose gels to membranes.

Electroblotter 27372-376 is ideal for the transfer of nucleic acids from sequencing gels to nylon membranes.

Electrophoresis: Cambrex FlashGel System

Not in Service at present at FV



The FlashGel™ System is the fastest way to separate DNA and the only way to **watch** DNA migration as it happens. This revolutionary new tool separates DNA in 2–7 minutes. Monitor gel runs right at the bench, without UV light. The highly sensitive system allows a 5X reduction in DNA amount saving both time and money.

- Get results in 5 minutes or less
- Watch DNA migrate at your bench, in real time without UV light
- Enjoy outstanding resolution and exquisite sensitivity

The FlashGel™ System consists of enclosed, disposable, precast agarose gel cassettes and a combination of electrophoresis and transilluminator unit.

- FlashGel™ Cassettes contain precast, prestained agarose gels and buffer – no need for gel preparation, buffer addition or gel staining.
- The FlashGel™ Dock is an electrophoresis apparatus with a built-in transilluminator that provides both separation and detection.

FlashGel™ Starter Kit includes:

- FlashGel Dock
- 9 FlashGel Cassettes
- 1 ml FlashGel Loading Dye
- 150 µl FlashGel DNA Marker

See Brochure for details.

Electrophoresis: E-Gel System; Quick Guide

Tip A quick reference table is provided below for your convenience.

Quick Reference Operating modes and electrophoresis runs are described below. You can use the table below as a quick reference guide to operate the E-Gel® PowerBase™ Version 4.

Mode/Run	Action	Sound	Light
Self test	Connect PowerBase to electrical outlet using adapter	2 beeps	Rapid red/green/blue flashes, followed by: **No light** (if no cassette is inserted) **Red light** (with cassette inserted)
Ready (No current flowing through gel)	E-Gel® inserted into base.	None	Steady red
Pre-run	Press and hold either button	One beep	Flashing green
30 minute run	Press and release the 30 min. button	One beep	Steady green
15 minute run	Press and release the 15 min. button	One beep	Steady Blue
End of run	Automatic	Rapid beeps	Flashing red
Stop run (return to Ready mode)	Press and release either button	One beep	Steady red
Failure	See **Troubleshooting**, next page	Rapid beeps	Steady red

Continued on next page

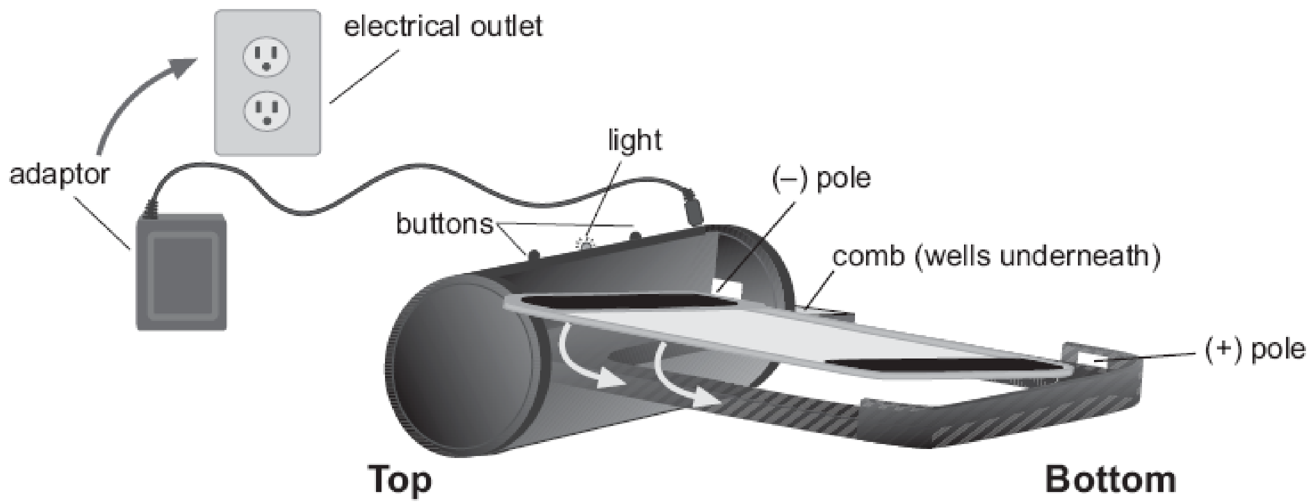
Done Unknown Zone

start note_gadget.txt ... http://tools.inv... Bmorrison on 'Fvc... Morrison_Protocols Microsoft PowerP... 12:02 PM

Electrophoresis: E-Gel System

Preparation

1. Plug the E-Gel® PowerBase™ Version 4 into an electrical outlet using the adaptor plug. The base will perform a brief self-test. (With no gel in the base, **no light** will be illuminated on the base after the self-test.)
2. Insert the E-Gel® gel **with the comb in place** into the PowerBase™, right side first and then press the left side into place. There should be an audible click. See diagram below.
3. A **steady, red light** will illuminate when the E-Gel® gel is correctly inserted (Ready Mode).



Electrophoresis: E-Gel System; Basic Operations and Interrupt

Basic Operation

Operation of the E-Gel® PowerBase™ Version 4 is controlled by two buttons on top of the base. The left button is for a double comb run and the right button is for a full single comb run (see the label on the unit). To select different electrophoresis runs for the PowerBase™, do one of the following

- Press and release the button OR
- Press and hold the button

Each electrophoresis run is indicated by the light next to the button. Please read the instructions on the next page for more details.

Note

You can interrupt the electrophoresis run at any time by **pressing and releasing** either button (one beep) to stop the current. This is indicated by a **steady red** light.

Do not pull the cassette out of the PowerBase™ if the current is still running; this may damage the PowerBase™.

You can restart the run by pressing the 15 min or 30 min button again. **Please note that the PowerBase™ will reset and start another 15 or 30 minute electrophoresis run. Monitor this electrophoresis run closely to avoid overrunning the gel.**

Do not let the PowerBase™ run for more than a total of **25 minutes** if using with a double-comb gel or **60 minutes** if using with a single-comb gel. Longer run times can result in a damaged gel.

Electrophoresis: E-Gel System; Pre-run and Running Gel

Pre-run

You must first pre-run the E-Gel® gel for 2 minutes **with the comb in place** before loading your samples to ensure proper resolution of your DNA fragments.

1. **Press and hold** either button until the **red** light turns to a **flashing-green light**. This indicates that the 2-minute pre-run has started.
2. At the end of the pre-run, current will automatically shut off. The **flashing-green** light will change to a **flashing red** light and the PowerBase™ will **beep rapidly**.
3. **Press and release** either button to stop the beeping (you will hear only one beep). The light will change from a **flashing** red light to a **steady** red light.
4. Remove the comb from a single-comb E-Gel® gel by carefully pulling it straight up. For a double-comb gel, remove the combs by gently pushing the side handles of each comb. Remove any fluid that is present in the well.
5. Load your samples into the well. For more details on sample preparation and loading, please refer to the E-Gel® manual.

Running the Gel

1. After loading the E-Gel® gel, choose from the appropriate running conditions below, depending on the type of gel you are using.
2. Using the E-Gel® PowerBase™ Version 4, choose between a 30-minute run for single-comb gels or a 15-minute run for double-comb gels).
   - For the 30-minute run, **press and release** the 30-min button to start the 30-minute electrophoresis run. The light will change to a **steady green** light.
   - For the 15-minute run, **press and release** the 15-min button. **A steady blue** light appears to indicate the beginning of the 15-minute run.

   Note: The actual running time of the E-Gel® gel may vary between 15 and 17 minutes for double-comb gels and 30 and 33 minutes for single-comb gels.
3. Current through the E-Gel® gel automatically shuts off at the end of each run. The E-Gel® PowerBase™ Version 4 signals the end of the run with a **flashing red** light and **rapid beeping**.
4. **Press and release** either button to stop the beeping. The light will turn to a **steady red light**. Remove the gel from the PowerBase™. You can now scan the E-Gel® gel with a transilluminator and/or perform other analysis. Please note that the bands will diffuse within 20 minutes.

Electrophoresis: E-Gel System; Trouble-Shooting

Trouble-shooting

If you find that you accidentally selected a different run than you intended, see below.

- If you are at the beginning of the run, simply stop the run and try again to select the desired electrophoresis run.
- If you are well into the run, then follow the guidelines below:
  - Check the gel and see where the loading dye is running.
  - Estimate the amount of time remaining and set a timer to remind you to check the gel.
  - If you have over-run your gel, immediately press and release the button to stop electrophoresis.
  - Remember that changing from one run mode to another will restart the run. For example, if you are 10 minutes into your run and you find that you chose the 30 minute run instead of the 15 minute run, changing to the 15 minute run will add an additional 15 minutes to the time already accrued. The gel will run 25 minutes before stopping (unless you manually stop the gel).

If the light turns to a steady red and a continuous rapid beeping occurs, the PowerBase™ is in Failure Mode. Press and release the button to return to Ready Mode. Failure Mode is caused by one of the following:

Problem	Reason	Solution
PowerBase™ does not return to Ready Mode	Defective cassette	Disconnect PowerBase™ and replace cassette
Voltage > 100 V	Cold cassette	Use a room temperature cassette
Improper operating conditions	Ambient temperature is <10°C or >45°C	Use PowerBase™ at room temperature (20°C-25°C)
No current	Defective cassette	Use a new cassette

Adaptor Specifications

Use only UL Listed Class 2 Direct Plug-in Adaptor included with the E-Gel® PowerBase.™ Input and Output supplied by the adaptor are shown in the table below.

Electrophoresis: E-Gel, BRDG, FlashGel/Lonza



	Lonza#	VWR#
DNA Starter Kit	57026	95015-612

FlashGel systems consist of enclosed, disposable, precast agarose gel cassettes and a combination electrophoresis and transilluminator unit.

FlashGel DNA system separates DNA in 2–7 minutes with outstanding resolution and allows monitoring of gel runs right at the bench without UV light. The highly sensitive system also allows 5–20 times the reduction in DNA levels, saving both time and money.
FlashGel RNA system is a fast and sensitive tool for analysis of sample integrity and optimized for the unique requirements of RNA. Recommended for verification and analysis of total RNA, quick checks of native RNA, and checking RNA degradation and mRNA purity. The system provides results in 30 minutes or less while avoiding use of hazardous reagents and contaminating RNases. RNA fragments are analyzed on the FlashGel system using the same fast and simple procedure used for DNA. Separation is complete in less than eight minutes and RNA samples are ready for imaging within 10–20 minutes. FlashGel system for RNA is 5–20 times more sensitive than ethidium bromide gels and RNA <10ng per band are clearly detected, conserving precious RNA samples.
FlashGel system for DNA recovery eliminates agarose gel preparation and delivers highly efficient recovery, free from inhibitors and UV-induced damage, in a simple 5–10 minute protocol. Go from sample loading to recovery in just five minutes. Recover samples directly from the cassette without band excision or purification. Visualize sample recovery without UV light and recover at 80–100% efficiency.
FlashGel Dock is an electrophoresis apparatus with a built-in transilluminator that provides visualization of both DNA and RNA cassettes.
The FlashGel camera captures gel images from the FlashGel system right at the benchtop with complete gel run and image capture in just five minutes.
FlashGel cassettes contain precast, prestained agarose gels and buffer with no need for gel preparation, buffer addition, or gel staining.

Ordering Information: DNA starter kit includes the FlashGel Dock; nine DNA cassettes with precast, prestained agarose gels (1.2% agarose) and buffer, in 12+1 well, single tier format; loading dye; and DNA marker (100bp–4kb). RNA starter kit includes nine RNase-free RNA cassettes that fully enclose the gel (1.2%), stain, and running buffer in 12+1 single tier format; formaldehyde sample buffer; RNA marker; and molecular biology water.

Electrophoresis: Power-Voltage-Current-Resistance

What are the relations between Voltage, Current, Power and Resistance?
Power (W) = Voltage (V) x Current (A)
Resistance (Ω) = Voltage (V) / Current (A)

How does a power supply react after pressing RUN?
The internal generator will start building up the high voltage at the output terminals while voltage and current are constantly measured and power calculated. When one of the pre-set parameters is exceeded, the generator stops and will keep that parameter constant.

How important is the resistance of an electrophoresis unit?
The resistance of an electrophoresis unit depends on its size, gel thickness, amount of buffer, buffer conductivity and temperature. This resistance will normally decrease in time due to a slowly increasing temperature***. Electrophoresis units which have a resistance below the minimum load resistance of a power supply will trigger an alarm and/or cause fuses to blow*** ! Read the output voltage and current during a run to measure the resistance and use above formula to calculate the value.

How to keep a constant voltage during a run?
Program the desired voltage and a higher current and power then the maximum expected values:
Current > Voltage / Resistance
Power > Voltage x Current
How to keep a constant current during a run?
Program the desired current and a higher voltage and power then the maximum expected values:
Voltage > Current x Resistance
Power > Voltage x Current
How to keep a constant power during a run?
Program the desired power and a higher voltage and current then the maximum expected values:
Voltage > Current x Resistance
Current > Voltage / Resistance